

WHAT IS CLAIMED IS:

1. An electrostatic actuator comprising:

a substrate;

a stationary electrode including a plurality of electrode plates disposed on the substrate in a comb-like pattern; and

a movable piece supported on the substrate and including a movable electrode including a plurality of electrode plates extending toward the electrode plates of the stationary electrode and arranged in a comb-like pattern; wherein

in one of the stationary electrode and the movable electrode, at least one of the lengths of the plurality of electrode plates is different from a length of another of the plurality of electrode plates; and

the movable electrode displaces the movable piece by an electrostatic force generated between the movable electrode and the stationary electrode.

2. An electrostatic actuator according to Claim 1, wherein in the other of the stationary electrode and the movable electrode, at least one of the lengths of the electrode plates is different from a length of another of the plurality of electrode plates.

3. An electrostatic actuator according to Claim 1, wherein the plurality of electrode plates of at least one of the

stationary electrode and the movable electrode have lengths which are stepwise different from each other.

4. An electrostatic actuator according to Claim 1, wherein the plurality of electrode plates of at least one of the stationary electrode and the movable electrode have lengths which are stepwise decreased in order from an electrode plate nearest to the movable piece to an electrode plate farthest from the movable piece.

5. An electrostatic actuator according to Claim 1, wherein the plurality electrode plates of at least one of the stationary electrode and the movable electrode define sets of electrode plates having equal lengths; and

the length of at least one set of electrode plates is different from the length of another set of electrode plates.

6. An electrostatic actuator according to Claim 5, wherein of the plurality of electrode plates of at least the other of the stationary electrode and the movable electrode, the electrode plates of the other electrode to be moved into the spaces between the sets of the electrode plates of the one electrode for meshing have widths larger than those of the adjacent electrode plates of the other electrode.

7. An electrostatic actuator according to Claim 1, wherein the plurality of electrode plates of at least one of the stationary electrode and the movable electrode includes at least two electrode plates which have lengths which are equal to each other.

8. An electrostatic actuator according to Claim 2, wherein the plurality of electrode plates of at least one of the stationary electrode and the movable electrode have lengths which are stepwise different from each other.

9. An electrostatic actuator according to Claim 2, wherein the plurality of electrode plates of at least one of the stationary electrode and the movable electrode have lengths which are stepwise decreased in order from an electrode plate nearest to the movable piece.

10. An electrostatic actuator according to Claim 2, wherein the plurality electrode plates of at least one of the stationary electrode and the movable electrode define sets of electrode plates having equal lengths; and

the length of at least one set of electrode plates is different from the length of another set of electrode plates.

11. An electrostatic actuator according to Claim 10, wherein of the plurality of electrode plates of at least the

other of the stationary electrode and the movable electrode, the electrode plates of the other electrode to be moved into the spaces between the sets of the electrode plates of the one electrode for meshing have widths larger than those of the adjacent electrode plates of the other electrode.

12. An electrostatic actuator according to Claim 3, wherein the plurality electrode plates of at least one of the stationary electrode and the movable electrode define sets of electrode plates having equal lengths; and

the length of at least one set of electrode plates is different from the length of another set of electrode plates.

13. An electrostatic actuator according to Claim 12, wherein of the plurality of electrode plates of at least the other of the stationary electrode and the movable electrode, the electrode plates of the other electrode to be moved into the spaces between the sets of the electrode plates of the one electrode for meshing have widths larger than those of the adjacent electrode plates of the other electrode.

14. An electrostatic actuator according to Claim 4, wherein the plurality of electrode plates of at least one of the stationary electrode and the movable electrode define sets of electrode plates having equal lengths; and

the length of at least one set of electrode plates is different from the length of another set of electrode plates.

15. An electrostatic actuator according to Claim 14, wherein of the plurality of electrode plates of at least the other of the stationary electrode and the movable electrode, the electrode plates of the other electrode to be moved into the spaces between the sets of the electrode plates of the one electrode for meshing have widths larger than those of the adjacent electrode plates of the other electrode.

16. An electrostatic actuator according to claim 1, further comprising inclined portions disposed between the plurality of electrode plates of the stationary electrode.

17. An electrostatic actuator according to claim 1, wherein the plurality of electrode plates of at least one of the stationary electrode and the movable electrode have lengths which are stepwise increased in order from an electrode plate nearest to the movable piece to an electrode plate farthest from the movable piece.

18. An electrostatic actuator according to claim 1, wherein the plurality of electrode plates of at least one of the stationary electrode and the movable electrode have lengths which are stepwise changed in a convex line in order from an electrode

plate nearest to the movable piece to an electrode plate farthest from the movable piece.

19. An electrostatic actuator according to claim 1, wherein in the other of the stationary electrode and the movable electrode, a width of at least one of the electrode plates is different from a width of another of the electrode plates.

20. An electrostatic actuator according to claim 3, wherein in the other of the stationary electrode and the movable electrode, a width of at least one of the electrode plates is different from a width of another of the electrode plates.